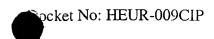What is claimed is:

1.   A method for determining the offset between at least two origins of a coordinate system used for at least two different defect inspection spaces, the method comprising:

5   collecting multiple sets of data spanning said defect inspection spaces;

filtering said data sets to remove points that introduce noise into correlation calculations ;

determining whether different said data sets show correlation;

10   selecting pairs of said data sets showing correlation greater than or equal to a metric, if different said data sets show correlation; and

calculating coordinate offsets of said origins based on the said selected pairs of said data sets.

2.   An apparatus for determining the offset between at least two origins

15 of a coordinate system used for at least two different defect inspection spaces, comprising:

means for collecting multiple sets of data spanning said defect inspection spaces;

means for filtering said data sets to remove points that introduce

20 noise into correlation calculations ;

means for determining whether different said data sets show correlation;

means for selecting pairs of said data sets showing correlation

greater than or equal to a metric, if different said data sets show correlation; and

means for calculating coordinate offsets of said origins based on the

said selected pairs of said data sets.

5   3.   A program storage device readable by a machine, tangibly

embodying a program of instructions executable by the machine to perform a

method of determining the offset between at least two origins of a coordinate

system used for at least two different defect inspection spaces, the method

comprising:

10   collecting multiple sets of data spanning said defect inspection

spaces;

filtering said data sets to remove points that introduce noise into

correlation calculations ;

determining whether different said data sets show correlation;

15   selecting pairs of said data sets showing correlation greater than or

equal to a metric, if different said data sets show correlation; and

calculating coordinate offsets of said origins based on the said

selected pairs of said data sets.

4.   A method for determining the offset between at least two origins of

20   a coordinate system used for at least two different defect inspections of a wafer at,

at least, a first layer and a second layer and with integrated circuits disposed on it,

the method comprising:

filtering defect data;

identifying each defect in said second layer lying near each defect in said

first layer;

computing coordinate differences between defects in said first layer and

5   said defects in said second layer;

finding dense zones where there are a relatively high density of offsets;

determining whether offsets in said dense zones are distributed randomly;

calculating descriptive statistics, including at least average offsets and

confidence limits, for said dense zones if said offsets are not distributed randomly;

10   and

reporting average offset and confidence limits.

5.   The method of claim 4, wherein said finding of dense zones

comprises:

dividing the range of each coordinate offset into a number of equal

15   intervals; and

selecting the interval with the greatest count of offsets as the dense

zone.

6.   An apparatus for determining the offset between at least two origins

of a coordinate system used for at least two different defect inspections of a wafer

20   at, at least, a first layer and a second layer and with integrated circuits disposed on

it, comprising:

means for filtering defect data;

means for identifying each defect in said second layer lying near each

defect in said first layer;

means for computing coordinate differences between defects in said first

layer and said defects in said second layer;

5   means for finding dense zones where there are a relatively high density of

offsets;

means for determining whether offsets in said dense zones are distributed

randomly;

means for calculating descriptive statistics, including at least average

10   offsets and confidence limits, for said dense zones if said offsets are not

distributed randomly; and

means for reporting average offset and confidence limits.

7.   The apparatus of claim 6, wherein said means for finding of dense

zones comprises:

15   means for dividing the range of each coordinate offset into a number

of equal intervals; and

means for selecting the interval with the greatest count of offsets as

the dense zone.

8.   A program storage device readable by a machine, tangibly

20   embodying a program of instructions executable by the machine to perform a

method for determining the offset between at least two origins of a coordinate

system used for at least two different defect inspections of a wafer at, at least, a

first layer and a second layer and with integrated circuits disposed on it, the

method comprising:

filtering defect data;

identifying each defect in said second layer lying near each defect in

5   said first layer;

computing coordinate differences between defects in said first layer

and said defects in said second layer;

finding dense zones where there are a relatively high density of

offsets;

10   determining whether offsets in said dense zones are distributed

randomly;

calculating descriptive statistics, including at least average offsets

and confidence limits, for said dense zones if said offsets are not distributed

randomly; and

15   reporting average offset and confidence limits.

9.   The program storage device of Claim 8, wherein said finding of

dense zones further comprises:

dividing the range of each coordinate offset into a number of equal

intervals; and

20   selecting the interval with the greatest count of offsets as the dense

zone.

10.   A method for determining the offset between at least three origins of

a coordinate system used for at least three different defect inspections of a wafer

with integrated circuits disposed on it, the method comprising:

5   finding all possible pairwise links between layers;

           constructing a tree of links;

           identifying from said tree all indirect paths along which layers can

be linked;

           calculating statistics of offsets between indirectly linked layers;

10   determining whether any pair of layers are linked by multiple paths;

           listing each pair of layers linked by multiple paths, if there are any

pair of layers linked by multiple paths;

           selecting a listed pair of layers that have not been previously

selected;

15   determining whether offsets associated with said listed pair of layers

are within confidence limits of each other;

           selecting the best estimate of said offsets;

           determining whether the system has selected all the of the listed

pairs; and

20   selecting a listed pair of layers that have not been previously

selected.

11   The method of claim 10, wherein selecting said best estimate

comprises averaging said offsets associated with said listed layer pairs.

12.   The method of claim 10, wherein selecting said best estimate

comprises calculating the median of said offsets associated with said listed layer

5   pairs.

13.   An apparatus for determining the offset between at least three

origins of a coordinate system used for at least three different defect inspections of

a wafer with integrated circuits disposed on it, comprising:

means for finding all possible pairwise links between layers;

10   means for constructing a tree of links;

means for identifying from said tree all indirect paths along which

layers can be linked;

means for calculating statistics of offsets between indirectly linked

layers;

15   means for determining whether any pair of layers are linked by

multiple paths;

means for listing each pair of layers linked by multiple paths, if there

are any pair of layers linked by multiple paths;

means for selecting a listed pair of layers that have not been

20   previously selected;

means for determining whether offsets associated with said listed

pair of layers are within confidence limits of each other;

means for selecting the best estimate of said offsets;

means for determining whether the system has selected all the of the

listed pairs; and

means for selecting a listed pair of layers that have not been

5 previously selected.

14.   The apparatus claim 13, wherein said means for selecting best

estimate further comprises means for averaging said offsets associated with said

listed layer pairs.

15.   The apparatus of claim 13, wherein said means for selecting said

10 best estimate comprises means for calculating the median of said offsets

associated with said listed layer pairs.

16.   A program storage device readable by a machine, tangibly

embodying a program of instructions executable by the machine to perform a

method for determining the offset between at least three origins of a coordinate

15 system used for at least three different defect inspections of a wafer with

integrated circuits disposed on it, the method comprising:

finding all possible pairwise links between layers;

constructing a tree of links;

identifying from said tree all indirect paths along which layers can

20 be linked;

calculating statistics of offsets between indirectly linked layers;

determining whether any pair of layers are linked by multiple paths;

listing each pair of layers linked by multiple paths, if there are any

pair of layers linked by multiple paths;

selecting a listed pair of layers that have not been previously

selected;

5   determining whether offsets associated with said listed pair of layers

are within confidence limits of each other;

selecting the best estimate of said offsets;

determining whether the system has selected all the of the listed

pairs; and

10   selecting a listed pair of layers that have not been previously

selected.

17.   The program storage device of claim 16, wherein said selecting the

best estimate comprises averaging said offsets associated with said listed layer

pairs.

15   18.   The program storage device of claim 16, wherein said selecting the

best estimate comprises calculating the median of said offsets associated with said

listed layer pairs.

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